Differences in Vascular Outcomes and Sedentary Behaviour in Pre- and Post-Menopausal Women

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Introduction: Vascular ageing, characterized by endothelial dysfunction and atherosclerosis is an integral component of cardiovascular disease (CVD) development. The menopause and its associated reduction in oestrogen accelerates female vascular aging. Sedentary behaviour (SB) and physical activity (PA) levels modify vascular risk and may further exacerbate aging induced pathological arterial remodelling. The aim of this study was to examine the differences in vascular artery health, PA and SB in pre- and post-menopausal women.
Methodology: Thirty-three female adults were recruited and grouped according to whether they were pre-menopausal (PRE-M; 31.4±10.7 years, BMI 24.7±6.7kg/m^2) or post-menopausal (POST-M; 55.3±7.3 years, BMI 25.5±4.8kg/m^2). Systolic (SBP) and diastolic (DBP) blood pressure was measured following 30 minutes supine rest. Vascular ultrasound was used to assess carotid artery intima media thickness (cIMT) and brachial artery vasodilator response to 5 minutes distal limb occlusion. Carotid artery reactivity (CAR%) to a cold pressor test was assessed and pulse wave velocity (PWV) was calculated using applanation tonometry. VO_{2max} was determined by a cycling ramp protocol to volitional exhaustion. Habitual SB and PA were measured over 7 days using an inclinometer and accelerometry respectively. Group differences were determined using independent t-tests.
Results: Significant differences ($p=<0.01$) were observed for SBP (107±7mmHg; 122±15mmHg), DBP (64±6mmHg; 70±6mmHg) and cIMT (0.58±0.07mm; 0.72±0.08mm) between PRE-M and POST-M women respectively. No significant differences were found between groups for PWV (PRE-M, 5.3±0.8cm/s; POST-M, 6.1±1.6cm/s) or CAR% (PRE-M; 1.56±2.4%, POST-M; 1.48±2.1%). VO_{2max} was higher in PRE-M (35.8±6.7mL/kg/min; 25.3±4.8mL/kg/min; $p<0.001$). Neither total PA time (PRE-M; 265.4±72mins/d , POST-M; 317±93.2mins/d) nor daily SB differed significantly between groups (PRE-M, 65.5±16%; POST-M, 53.9±21.3%).
Coclusion: Our findings confirm that SBP, DBP and cIMT increase with age. Despite a lower VO_{2max} in POST-M, PA and SB patterns did not differ between PRE- and POST-M women. Our findings may indicate that $VO_{2max,}$ and not PA or SB level plays an important role in mediating some markers of vascular aging in post menopausal women, however further research is needed to confirm this.